

## HEAT-RESISTANT RESIN COMPOSITION AND PRODUCTION OF ELECTRICAL OR ELECTRONIC COMPONENT INSULATED THEREWITH

**Publication number:** JP7102033 (A)  
**Publication date:** 1995-04-18  
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**Classification:**  
- **international:** *C08G18/62; C08G18/64; C08G18/69; C08G18/00*; (IPC1-7): C08G18/62; C08G18/64; C08G18/69  
- **European:**  
**Application number:** JP19930246706 19931001  
**Priority number (s):** JP19930246706 19931001

### Abstract of JP 7102033 (A)

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## PATENT ABSTRACTS OF JAPAN

(11)Publication number : 07-102033

(43)Date of publication of application : 18.04.1995

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(51)Int.Cl. C08G 18/62  
C08G 18/64  
C08G 18/69

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(21)Application number : 05-246706

(71)Applicant : HITACHI CHEM CO LTD

(22)Date of filing : 01.10.1993

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CONSTITUTION: This resin composition comprises a product of hydrogenation of a liquid hydroxylated polyisoprene, a castor oil derivative and a polyisocyanate.

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CLAIMS

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[Claim(s)]

[Claim 1](a) A heat resistant resin composition containing a hydride of hydroxyl group content liquefied polyisoprene, (b) castor oil derivative, and (c) polyisocyanate.

[Claim 2]A manufacturing method of an electric electronic component which carries out casting of the heat resistant resin composition according to claim 1 to an electric electronic component, and hardens it and by which the insulation process was carried out.

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## DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Industrial Application]A hardened material suitable for moisture proof insulation treatment etc. is low hardness, and this invention relates to the manufacturing method of the heat resistant resin composition excellent in heat resistance, and the electric electronic component by which the insulation process was carried out.

[0002]

[Description of the Prior Art]An electric appliance is in the tendency of a small weight saving and multi-functionalization every year, and the insulation process is performed in order to protect the packaged circuit board carried in the various electric appliances which control this from humidity, dust, etc. The casting processing by the protective coating processing by paints, such as an acrylic resin and silicon resin, or urethane resin, an epoxy resin, silicon gel, etc. is widely adopted as this insulation process method. Thus, a packaged circuit board is used under a harsh environment, especially high humidity, for example, is used, being carried in apparatus, such as a washing machine and a car. However, said paint could not carry out protective coating of the pin leg of the electronic parts carried in the packaged circuit board thoroughly, but there was a problem that a water resisting property was inferior. On the other hand, although the urethane resin used for casting processing and an epoxy resin had the outstanding insulation and water resisting property, when neglected under hot conditions for a long time, the hardened material became hard by oxidation degradation, stress was applied to parts, a packaged circuit board, etc., a crack and exfoliation occurred, and there was a possibility that reliability might fall. Although the hardened material became low hardness and silicon gel was excellent in heat resistance, the price was high and there was a problem in economical efficiency.

[0003]

[Problem(s) to be Solved by the Invention]This invention solves the problem of such conventional technology, and a hardened material suitable for moisture proof insulation etc. is low hardness, and it provides the manufacturing method of the heat resistant resin composition which is excellent in heat resistance, and the electric electronic component by which the insulation process was carried out.

[0004]

[Means for Solving the Problem]This invention carries out casting of a heat resistant resin composition containing (a) hydride, (b) castor oil derivative, and (c) polyisocyanate and this constituent of (a) hydroxyl group content liquefied polyisoprene to an electric electronic component, and relates to a manufacturing method of an electric electronic component to harden and by which the insulation process was carried out.

[0005]a hydride of (a) hydroxyl group content polyisoprene used for this invention has a hydroxyl group in intramolecular or a molecular terminal -- a number average molecular weight -- usually -- 500-10,000 -- it is 1,000-5,000 preferably. As this commercial item, trade name epaule (made by an Idemitsu petrochemical company) is mentioned, for example.

[0006](b) castor oil derivative used for this invention is an ester interchange thing of castor oil and alcohols. As this commercial item, trade name URIC H-31, Y-403, and Y-406 (all are the Ito

Oil Mill company make) are mentioned, for example. As for a blending ratio of a castor oil derivative, it is preferred to consider it as the range of 3 – 30 weight section from hardness, moisture resistance, and heat resistance of a hardened material to hydride (a) of aforementioned hydroxyl group content polyisoprene 100 weight section, and it is more preferred to consider it as the range of 5 – 20 weight section.

[0007](c) polyisocyanate used for this invention, It is what is used as a hydride of aforementioned (a) hydroxyl group content liquefied polyisoprene, and a hardening agent of (b) castor oil derivative, For example, tolylene diisocyanate, diphenylmethane diisocyanate, Naphthalene diisocyanate, xylylene diisocyanate, diphenylsulfone diisocyanate, Triphenylmethane diisocyanate, hexamethylene di-isocyanate, A 3-isocyanatemethyl-3,5,5-trimethyl cyclohexylisocyanate, A 3-isocyanateethyl-3,5,5-trimethyl cyclohexylisocyanate, A 3-isocyanateethyl-3,5,5-triethylcyclohexylisocyanate, Diphenylpropanediisocyanate, phenylene diisocyanate, SHIKUROHE xylylene diisocyanate, 3, and 3'-diisocyanate dipropyl ether, Polyisocyanate or the above-mentioned isocyanates, such as triphenylmethane triisocyanate and diphenyl ether 4,4'-diisocyanate, phenols, oxime, imide, mercaptans, alcohols, epsilon caprolactam, ethyleneimine, A prepolymer etc. which have an end isocyanate group derived from these isocyanates, such as what blocked with alpha-pyrrolidone, diethyl malonate, a hydrogen sulfite, sodium, boric acid, etc., and carbodiimide denaturation diphenylmethane diisocyanate, are mentioned. (c) A blending ratio of polyisocyanate from hardenability and the characteristic of a resin composition. It is preferred that an isocyanate group in polyisocyanate considers it as 0.8–1.3 Eq to a total amount of a hydride of aforementioned (a) hydroxyl group content liquefied polyisoprene and a hydroxyl group of (b) castor oil derivative.

[0008]In a heat resistant resin composition which becomes this invention, if needed Phthalic ester, Plasticizers, such as a compound produced by polymerizing and hydrogenating alpha olefin, phosphoric ester, Various kinds of additive agents, such as hardening accelerators, such as tackifiers, such as fire retardant, such as hydrated alumina, xylene formaldehyde resins, and petroleum resin, and dibutyltin dilaurate, a dehydrator, an antioxidant, paints, and a color, may be blended in the amount of anticipated use.

[0009]What is necessary is to carry out casting of this constituent to the above-mentioned electric electronic component, and just to harden it by a casting method generally known, as that manufacturing method, although electrical and electric equipment [, such as parts and a packaged circuit board, ], such as a capacitor, a transformer, etc. by which moisture proof insulation was carried out using a heat resistant resin composition which becomes this invention, is manufactured. Hardening after casting is a room temperature, or is performed by heating.

[0010]

[Example]Although an example explains this invention below, this invention is not restricted to these.

The characteristic of the hardened material of the resin composition obtained with the combination presentation and loadings (weight section) which are shown in the Examples 1–2 and comparative example 1 table 1 was measured by the method shown below. A result is shown in Table 1.

(1) Hardness : pour in 20g of resin compositions into a metal petri dish 60 mm in diameter, and pick out a hardened material from a metal petri dish after 4-hour hardening at 80 \*\*. Measurement was neglected to the measurement temperature of 25 \*\* immediately after hardening (after carrying out thermal degradation at the first stage and 125 \*\* for 500 hours), and was measured with the Shore A hardness scale.

(2) Moisture resistance : the volume resistivity of resin after neglecting a resin composition after 4-hour hardening at 80 \*\* for 500 hours in 85 \*\* and the homiothermal constant humidity chamber of 85% of humidity was measured according to JIS C-2105 (it measures by 25 \*\* and DC500V).

[0011]

[Table 1]

表 1

			実施例 1	実施例 2	比較例 1
配合量 (重量部)	水酸基含有液状ポリイソプレン *1 の水素化物		100	100	—
	ヒマシ油誘導体 *2		7	14	—
	水酸基含有液状ポリブタジエン *3		—	—	100
	$\alpha$ -ポリオレフィン *4		85	85	—
	ジウンデシルフタレート		50	50	100
	ジブチルスズジラウレート		0.02	0.02	0.02
硬化物 特性	カルボジイミド変性ジフェニル *5 メタンジイソシアネート		17	20	13
	硬 度 (25℃、ショアA)	初 期	15	5	5
		125℃/500h 劣 化 後	16	7	40
	耐 湿 性 (25℃、体積抵抗率、SL-cm)		$2 \times 10^{13}$	$9 \times 10^{12}$	$1 \times 10^{11}$

\*1 出光石油化学社製 商品名 エポール

\*2 伊藤製油社製 商品名 URICH-31

\*3 出光石油化学社製 商品名 PolybdR-45HT

\*4 出光石油化学社製 商品名 PAO5010

\*5 日本ポリウレタン社製 商品名 ミリオネートMTL

[0012]

[Effect of the Invention] The hardened material of the heat resistant resin composition of this invention is low hardness, is excellent in heat resistance and moisture resistance, and can obtain the parts and packaged circuit board to which moisture proof insulation treatment of the high reliability was carried out by this.

[Translation done.]